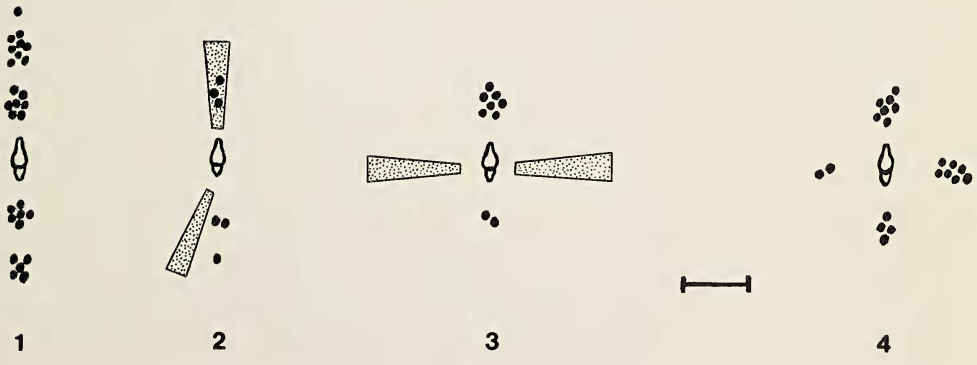
DETRITUS STABILAMENTA ON THE WEBS OF *CYCLOSA TURBINATA* (ARANEAE, ARANEIDAE)

Members of the genus *Cyclosa* have a well-known behavior of including prey remains and other debris in the stabilamenta of their orb-webs. Individuals of *C. turbinata* place such detritus in a vertical row of clusters above and below the hub (Fig. 1); the spider's size and coloration resemble a detritus cluster. I summarize here a preliminary laboratory study of the cue used by two adult female *C. turbinata* to develop the vertical row of detritus. The question was whether the spider responds to a pre-existing web structure (the silk stabilamentum) or to a geotactic cue, which itself probably provided the orientational stimulus for the placement of the silk stabilamentum during web construction.

A first indication that detritus placement was determined geotactically was the addition of prey remains beneath the hub of one web in a 6 o'clock direction rather than in the lower arm of the silk stabilamentum, which was pointing in the 7 o'clock direction (Fig. 2). Another clue was that the line of detritus in some webs extended to the frame threads of the orb, well beyond the extent of the original silk stabilamentum.

Rotation of the cages (15 gallon terraria) to a new position provided a method of study. (To control for phototactic effects, the light source was placed perpendicular to the plane of the web.) The addition of detritus to each of five new webs was observed after 90° rotations. In two of the cases no silk stabilamentum was built; nonetheless, insect remains were added to the current vertical axis. In the other cases such detritus likewise was added in the 12 and 6 o'clock directions rather than to the now-horizontal silk stabilamentum (Fig. 3). A cross-shaped detritus stabilamentum was obtained simply



Figs. 1-4.—Orientation of stabilamenta on webs of female *Cyclosa turbinata*. Shown diagrammatically are the spider's body (facing down), silk stabilamenta (stippled) when present, and detritus placed in position by the spider. Each dot represents the remains of one insect; separation of items within a cluster sometimes is exaggerated for clarity: 1, arrangement of detritus in a typical web; 2, detritus placement independent of the lower arm of the silk stabilamentum; 3, web rotated 90° prior to capture of insect prey, which were subsequently added to the new vertical axis; 4, web rotated 90° after detritus placement in the original vertical axis; prey added subsequently to the new vertical axis. Scale line = 1 cm.

by rotating the cage 90° during the interval between the first and second provisioning of the cage with a group of small flying insects (Fig. 4).

A string of detritus accumulated in one web often was included in the next web built by an individual, even though the latter web was at a new site as much as 15 cm distant. Identification of individual insect remains from the previous web and lack of a fresh prey supply after web construction confirmed that transport of the detritus stabilamentum had occurred. This explains how perfect webs can contain a large amount of prey remains even when constructed at a new site.

These data indicate that: (i) *C. turbinata* develops detritus stabilamenta independently of silk stabilamenta. (ii) Detritus placement is directed by geotaxis rather than by tactile or tensional cues from the silk stabilamentum, which itself is not always present. (iii) Detritus stabilamenta can be carried to new web sites for further use.

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